CRITICAL SUCCESS FACTORS IN IT PROJECTS: CHALLENGES AND EFFECTIVENESS

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Thesis submitted in fulfilment of the requirements
for the award of the degree of
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SUPERVISOR'S DECLARATION

I hereby declare that I have checked this project and in my opinion, this project is adequate in terms of scope and quality for the award of the degree of Bachelor of Project Management with Honours.

Signature
Name of Supervisor: DR MOHD RIDZUAN BIN DARUN
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Date:

STUDENT'S DECLARATION

I hereby declare that the work in this project is my own except for quotations and summaries which have been duly acknowledged. The project has not been accepted for any degree and is not concurrently submitted for award of other degree.

Signature

Name: TAN XING JIA

Date:

This Degree dissertation is dedicated to my parents

Tan Ching Yong and Ng Lam Bay

who introduced me to the joy of reading from birth,
enabling such a study to take place today.

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Sincerely, thanks.

ABSTRACT

Information Technology (IT) projects have bigger contribution to the country economy and development. However, IT project management is a crucial task because many IT projects failed due to project delayed, over budget or not achieved the planned scope. The main objectives of this research are identifying critical success factors in IT projects and to investigate the challenges and effectiveness of the critical factors in IT projects. Meanwhile, this research also investigates the relationships between critical success factors and IT project success. A research framework with 7 critical success factors was developed based on the thorough literature review. These 7 factors are collected based on their importance to IT projects and their repeated occurrence in the literature related to the critical success factors. Surveying method has been used to collect data and the data collected are being analysed by using Statistical Package for the Social Sciences (SPSS) software. The respondents are selected from the IT companies that are located in Kuala Lumpur and Selangor with a Multimedia Super Corridor (MSC) status under the InfoTech group. This research is useful for IT companies where project managers can benefit from the mentioned critical success factors by concentration on them while planning and executing IT projects. From the results, it is observed that there are positive significance relationships between two (2) critical success factors and IT project success. Therefore, the results are significant to enhance the success rates of IT projects in Malaysia.

ABSTRAK

Projek informasi technologi (IT) memberikan sumbangan penting kepada ekonomi negara dan juga pembangunan. Walau bagaimanapun, pengurusan dalam projek IT merupakan satu tugas yang penting kerana banyak projek IT gagal atas sebab ditangguhkan, lebih bajet atau tidak mencapai skop yang dirancang. Objektif utama bagi kajian ini adalah untuk mengenal pasti faktor-faktor kejayaan kritikal dalam projek IT dan untuk menyiasat cabaran serta keberkesanan faktor-faktor kritikal dalam projek IT. Di samping itu, kajian ini juga ingin mengetahui hubungan antara faktor-faktor kejayaan kritikal dengan kejayaan projek IT. Satu rangka kerja untuk kajian ini telah ditentukan dengan 7 faktor kejayaan kritikal berdasarkan kajian literatur yang menyeruluh. 7 faktor ini telah dipilih berdasarkan kepentingannya untuk projek IT dan berulangkan mereka dalam kajian lepas yang berkaitan dengan faktor-faktor kejayaan kritikal. Kaedah kaji selidik telah digunakan untuk mengumpul data and data yang diperoleh telah dianalisis dengan menggunakan Pakej Statistik untuk Sains Sosial perisian (SPSS). Responden yang terpilih adalah terdiri daripada syarikat-syarikat yang terletak di Kuala Lumpur dan Selangor dengan status Multimedia Super Corridor (MSC) di bawah kumpulan InfoTech. Kajian ini amat bermakna kerana pengurus projek dapat focus faktor-faktor kejayaan kritikal tertentu ketika merancang dan melaksanakan projek IT. Keputusan kajian ini menunjukkan bahawa terdapat dua (2) faktor kejayaan kritikal mempunyai pertalian yang signifikan positif dengan kejayaan projek IT. Jadi, keputusan kajian ini dapat meningkatkan kadar kejayaan projek IT di dalam Malaysia.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ERP	Enterprise Resource Planning
ICT	Information and Communications Technology
IHL	Institutes of Higher Learning
IT	Information Technology
KL	Kuala Lumpur
KPIs	Key Performance Indicators
MSC	Multimedia Super Corridor
PM	Project Management
PMI	Project Management Institute
PMPA	Project Management Performance Assessment
SPSS	Statistical Package for the Social Sciences
VIF	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In this fast development world, information technology (IT) playing an important role in supporting organizations' businesses. There are many factors can contribute to a successful IT project such as team factors, technical factors, organizational factors and so forth. Therefore, it is important for IT companies to identify the critical success factors that are most effective to their IT projects. Sudhakar (2012) claims that project managers should emphasize on multi factor model for critical project success factors as well as examine the relative importance among those factors.

This chapter will provide general information and ideas of this study. Then, a brief explaination on problem background and problem statement will also be included. Besides that, the objectives of research, research questions and scope will be covered. Lastly, the importance of this research will be cited in the significance of study.

1.2 PROBLEM BACKGROUND

IT projects have affects organizations in the way of making investments since the world has realized that it can create competitive advantages in the market. However, there are many IT projects around the world have failed because of lacking guidelines on manage IT projects. IT project management is a crucial task as many IT projects failing to achieve their intended results (Latendresse and Chen, 2003). 30 per cent to 70

percent of IT projects will be delayed, over budget or not achieved the planned scope (Bowers, 2009).

The IT sector has contributes in development of Malaysia's economic. Although IT investment brings benefits, however, IT projects are mostly known to face a lot of challenges and the projects might be out of control, since it is tough to fulfill the projects' justifications. This is because most companies have limited knowledge of what contributes to the success of an IT project (Aladwani, 2002). The demand of an IT project to be no errors is still a challenge to the IT industry.

1.3 PROBLEM STATEMENT

In this day and age, IT project management has become crucial issue for companies. A large number of IT projects fail and are not achieve to completion. According to a comprehensive report by The Standish Group (1999) that presents data on 23,000 IT projects from 1994 to 1998, 31 percent of IT projects failed in 1994, 40 percent were unsuccessful in 1996, and 28 percent were cancelled in 1998. Table 1.1 shows some history of IT project's failure from year 2000-2011. Basically, there are many resources can be saved by enhancing the success rate of the IT projects. If an IT project manager be aware of the critical success factors of his or her project, the success rate of his or her project can be increased. As a result, finding the critical success factors that can be implemented for IT projects help to minimise the failures of IT projects.

Table 1.1: History of IT project's failure

Year	Company	Outcomes (Costs in US $)
2011	CareSource Management	CareSource is demanding at least $1.5 million in damages.
2011	TechnoDyne	Cost overruns and a criminal probe into an alleged kickback scheme. TechnoDyne executives have been charged.
2005	Hudson Bay Co. [Canada]	Problems with inventory system contribute to $33.3 million loss.

Table 1.1: Continued

Year	Company	Outcomes (Costs in US $)
2004-05	UK Inland Revenue	Software errors contribute to $3.45 billion tax-credit overpayment.
2004	Avis Europe PLC [UK]	Enterprise resource planning (ERP) system cancelled after $54.5 million is spent.
2004	Ford Motor Co.	Purchasing system abandoned after deployment costing approximately $400 million.
2004	J Sainsbury PLC [UK]	Supply –chain management system abandoned after deployment costing $527 million.
2003-04	AT&T Wireless	Customer relations management upgrades problems lead to revenue loss of $100 million.
2002	McDonald's Corp.	The Innovate information-purchasing system cancelled after $170 million is spent.
2002	Sydney Water Corp. [Australia]	Billing system cancelled after $33.2 million is spent.
2002	CIGNA Corp.	Problems with CRM system contribute to $445 million loss.
2001	Nike Inc.	Problems with supply-chain management system contribute to $100 million loss.
2001	Kmart Corp.	Supply-chain management system cancelled after $130 million is spent.
2000	Washington D.C.	City payroll system abandoned after deployment costing $25 million.

Source: Kanaracus (2011) and Charette (2005)

1.4 RESEARCH OBJECTIVES

The objectives of this research are:

i. To identify critical success factors in IT projects

ii. To determine the challenges in IT projects
iii. To assess the effectiveness of critical factors in IT projects
iv. To investigate the relationship between critical success factors and IT project success

1.5 RESEARCH QUESTIONS

This research is carried out to seek answers for:

i. What are the critical success factors in IT projects?
ii. What are the challenges in IT projects?
iii. Which critical factor is more effective in IT projects?
iv. What is the relationship between critical success factors and IT project success?

1.6 RESEARCH HYPOTHESIS

- Change management playing a crucial role on effective balancing of forces in order to overcome forces of resistances if any changes happened during project. Change management is a necessary consideration in implementation of a project (Finney and Corbett, 2007).

H1: There is a positive significant relationship between change management and culture program and the IT project success.

- IT project must receive approval or support from top management before it can be proceeding. The willingness of top management to support the IT project is important on the aspect of resources allocation. Young and Jordan (2008) have proved that top management support is the most important factor for project success.

H2: There is a positive significant relationship between top management support and the IT project success.

- A clearly defined and documented plan and vision helps the project process becomes smooth in order to achieving success. Mirza et al. (2013) stated that there is almost impossible for achieving success if without an agreed upon and documented vision.

H3: There is a positive significant relationship between business plan and vision and the IT project success.

- In different stages of implementation, companies are able to plan, coordinate and monitor various activities with effective project management. Mir and Pinnington (2014) had proved that there is a statistically positive relationship between project management performance and project success in their research.

H4: There is a positive significant relationship between project management and IT project success.

- With project champion, there are many project's technological and strategic issues can be solved. Project champion is important in achieving project success as he or she can facilitates and enhance team motivation (Françoise et al., 2009).

H5: There is a positive significant relationship project champion and IT project success.

- Expectations or targeted goals at every level should be communicated. Complete and open communication ensures honesty and helps to achieve IT project success. Hyväri (2006) founds that communication is significantly contribute to the success of information system project.

H6: There is a positive significant relationship between communication and IT project success.

- An IT project can be considered as success when it is completed and fulfill the expectations of stakeholders in terms of time, cost, scope and quality. Mahaney

and Lederer (2010) stated that the purposes of monitoring are ensure that a project is progressing within acceptable budget, schedule and quality expectations.

H7: There is a positive significant relationship between monitoring and evaluation of performance and IT project success.

1.7 SCOPE

The population of this study is referred to status companies in online database of Multimedia Super Corridor (MSC) Malaysia. The companies are being classified into five clusters which are creative multimedia, IHLs and incubators, IHLs and amp; incubators, InfoTech and shared services outsourcing. However, the population of this study is only referring to IT companies have been listed in the online database under group "InfoTech" (accessible online at http://www.mscmalaysia.my/status_company) and located at the area of Kuala Lumpur (KL) and Selangor. This is because most of the IT companies are located at KL and Selangor where the development in IT fields are fast compared to other states. For example, there is several IT zones can be found in these two places such as Cyberjaya, Putrajaya, Petaling Jaya, Bangsar South and so on.

1.8 SIGNIFICANCE OF STUDY

This research will propose a guideline for IT industry to manage their IT projects. The outcomes of the study helps IT industry to know what are the critical factors need to be considered in order to make project success. Besides that, they can also know about the effectiveness of each factors as well as challenges to achieve success in IT projects. Therefore, this study is intended to carry out to increase the number of successful IT projects in Malaysia.

1.9 OPERATIONAL DEFINITION

1.9.1 Information Technology (IT) Project

According to Marchewka (2010), IT projects are organizational investments. It is done to support every possible industry and business function. It is different from other projects and is typically emphasis on computer technology such as hardware and software.

1.10 EXPECTED RESULTS

From this research, I am expecting that I would be able to identify the critical success factors in IT projects. Besides that, this research also aim to know about which challenges and critical success factors contributes the most to IT projects. Last but not least, I also expect that the relationships between variables can be proved throughout the research. Thus, it can be used as references for IT companies to enhance their IT projects.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to provide a more detail information and review of studies relevant to this research topic. This chapter explains definition of project success, factors that contribute to IT project success as well as challenges and problem arise in managing IT projects. Last but not least, this chapter also provides the theoritical framework of this research.

2.2 PROJECT SUCCESS

There are many meanings for the project success. A project can be considered as success if it is achieve the requirements or expectations of stakeholders. According to Prabhakar (2008), the project success in any organization is assessed by different types of stakeholders such as employees and customers. He also said that project manager plays an important role in making a project success.

Project success can also define as the achievement of project completion on time, within budget and achieving predefined project goals. Andersen et al. (2006) stated that the project success is the achievement of intended outcomes in terms of budget, time and specification. Marshall (2007) claims that project success is an achievement that involves meeting schedule, budget goals, benefit to customer, preparing for future as well as the commercial success.

According to Sudhakar (2012), project success is include two components which are project management success and project product success. Figure 2.1 shows the concept of project success. Therefore, project can count as success not only if finished with target cost, schedule, meet customer satisfaction and functionality but it also means the project is execute efficiently and effectively (Sofian, 2003).

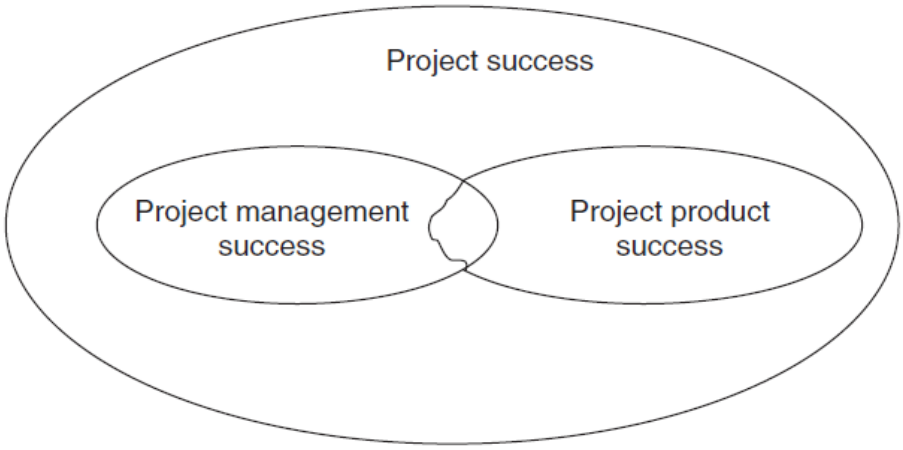

Figure 2.1: The meaning of project success

Source: Sudhakar (2012)

2.3 CRITICAL FACTORS THAT CONTRIBUTE TO THE SUCCESS OF IT PROJECTS

There are many researchers had identified critical success factors that contribute to the success of IT projects. Wong and Tein (2004) have determined 23 critical success factors for projects of Enterprise Resource Planning (ERP) system. Pinto and Slevin have conducted a survey of 418 Project Management Institute (PMI) members in finding the critical success factors in the stage of project implementation (Prabhakar, 2008). Besides that, Belassi and Tukel have categorized the factors that can affect the performance of project into organization, project, team members, project managers and external environment (Prabhakar, 2008). Table 2.1 shows the review of critical success factors for IT projects.

Table 2.1: Review of critical success factors for IT projects

	Change Management and culture program	Top management support	business plan and vision	project management	project champion	communication	Monitoring and evaluation of performance
Fiona, Kathryn, and Janet (2009)	√	√	√	√	√	√	√
Finney and Corbett (2007)	√	√	√	√	√	√	
Ngai, Law, and Wat (2008)	√	√	√	√	√	√	√
King and Burgess (2005)		√		√	√		
Noé and Luis E. (2007)	√	√	√	√	√	√	
Soja (2006)		√					√
Hong (2007)		√		√		√	
Olson and Zhao (2007)		√	√	√	√	√	
Francoise, Bourgault and Pellerin (2009)	√	√	√	√	√	√	√
Jafari, Osman, Yusuff, and Tang (2006)		√		√		√	
Jing and Qiu (2007)		√		√		√	
Jiang (2005)		√		√			
Al-Fawaz, Al-Salti and Eldabi (2008)		√	√	√	√		
Ngai, Cheng and Ho (2007)		√				√	
Number of citations	5	14	7	12	8	10	4

2.3.1 Change Management and Culture Program

A project might consist of uncertainties that are difficult to be predicted. Hence, change management is becoming an increasingly important subject because it helps to deal with the uncertainties. Finney and Corbett (2007) said that change management is a necessary consideration in implementation of a project. The change management program should create a culture with shared values and common objectives, focus on quality, train users and involve them in the system design. A culture with shared values and a good corporate identity that is benefits to change is crucial (Nah et al., 2009).

Françoise et al. (2009) stated the actions should be taken to support this factor are:

i. Formally getting support from opinions leaders
ii. Make sure the executives adopt the new systems
iii. Assess the organization's capacity in order to accept change
iv. Provide a complete training
v. Determine the risks and develop mitigation plans
vi. Evaluate the scope of change regularly

vii. Circulate information on the benefits and changes
viii. Control expectations that are related to system's functionalities
ix. Start the transition when the organization is ready
x. Reduce resistance to change at an early stage
xi. Maintain employees' motivation along the project
xii. Set up conference room pilots during the project

2.3.2 Top Management Support

Top management support has been widely recognized because they are the persons who make the investment decision. Without commitment of resources from top management, an IT project cannot be proceeding well. In the research of Young and Jordan (2008), they have proved that top management support is the most important factor for project success. They denied qualified, focused and hardworking project member as the crucial part for project success. It is suggested that quality of top management support determine the project success once an elementary level of competency has been recruited. Besides that, they also recommend that top managers should transparent in resolving problems and issues between different user priorities.

Top management support is critical during the project planning stage for finalize the project's total budget. Belout and Gauvreau (2004) mentioned about roles of top management in the process of negotiations with external and internal stakeholders, formation process of project team as well as the determination of work processes. They conclude this factor is necessary to success the subsequent operations. Top management support should direct the implementation teams and monitor the project progress at the same time (Al-Fawaz et al., 2008). Therefore, top management should support full implementation of project and does not end with initiation and facilitation.

2.3.3 Business Plan and Vision

There are many projects start with good ideas but failed in the end. One of the reasons for this scenario to happen is lack of defining project and product scope at the early stage of project. According to Mirza et al. (2013), there is almost impossible for

achieving success if without an agreed upon and documented vision. It is important for each project to clearly plan and specify its scope in order to let the project carry out in a coordinated manner. In the research of Olson and Zhao (2007), business vision was chosen by most organizations in the assessment phase as one of the critical success factors for ERP system upgrading project. Schwalbe mentioned that the three competing and interrelated goals in the project management are scope, cost and time (Al-Fawaz et al., 2008). Therefore, a conceptualization of the goals and possible ways to strive the targeted goals should be identified in the early stage of any project. At the same time, the business plan and vision should be explained clearly in order to indicate the general directions of the IT project.

2.3.4 Project Management

According to PMBOK 4th Edition, a project can be defined as a temporary endeavor undertaken to create a unique product, service, or result. Project Management (PM) is important for any IT project and it can be assessed by using project management performance assessment (PMPA) model (Mir and Pinnington, 2014). The integral parts of PMPA model are PM leadership, PM staff, PM policy and strategy, PM partnerships and resource, Project life cycle management processes and PM Key Performance Indicators (KPIs). Mir and Pinnington (2014) have proved that there is a statistically positive relationship between PM performance and project success in their research. PM staff and PM leadership have high contribution towards the project success. Woo (2007) identified project management as one of the critical success factors for implement ERP system. As a result, IT project should led by a good project manager with plans and schedules.

2.3.5 Project Champion

At the early stage of every project, the hopes and expectations might be very high. Unfortunately, some projects are missing the timelines, fail to deliver the objectives, exceed the budget and so on. Hence, project champion is needed because he or she is the person who ensuring everyone involved is on board to achieve the project

success. Bowen et al. (2007) found that project champion can aid significantly in managing IT development processes as well as monitoring IT operations quality.

Besides that, Françoise et al. (2009) also mentioned that project champion is important in achieving project success because he or she can facilitates and enhance team motivation. Project champion also helps to develop enthusiasm and convergence on common goals. Tan et al. (2009) conclude that a senior manager is needed to champion the project. The stress comes from work may decrease employees' morale and hence project champion is needed to motivate the team members during the project.

2.3.6 Communication

A successful project manager must have a good communication skill. According to the Project Management Institute (PMI) report, Pulse of the Profession (2013), 55 percent of project manager have the same point of view which is effective communication to all stakeholders is the most critical success factor in project management. This report also revealed that ineffective communications leads to fewer successful projects. Figure 2.2 shows the result of a research from PMI that is organizations with minimally-effective communicators report significantly fewer projects that meet original goals, come in on time and finishing on budget.

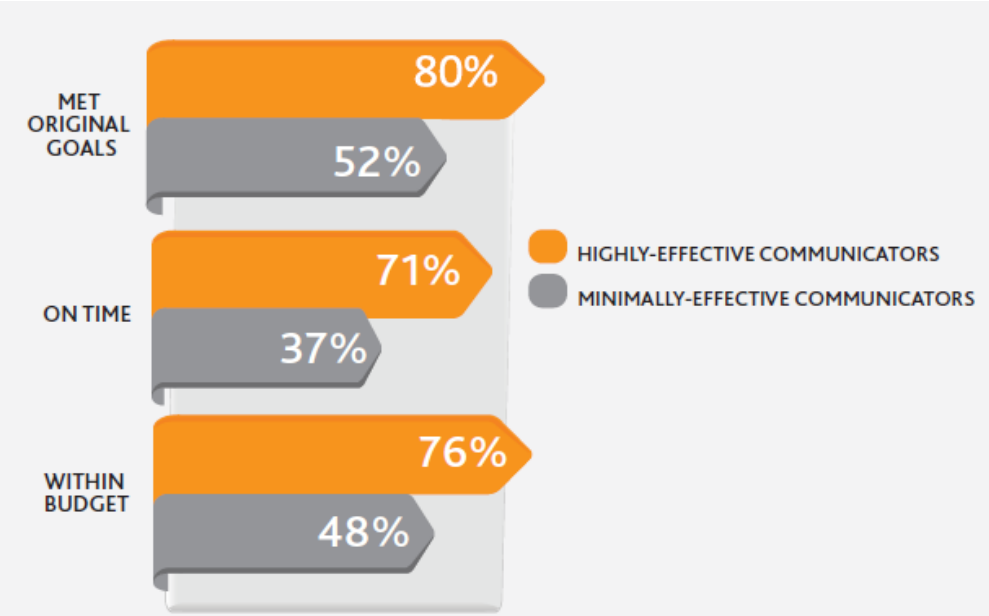

Figure 2.2: Organizations that communicate more effectively have more successful projects

Source: Project Management Institute, PMI (2013)

Hyväri (2006) founds that communication in project teams is a significant success factor in bigger companies. Communication is one of the most important success factors in the information system project (Hyväri, 2006). As a project manager, he or she needs to plan and coordinate many efforts rather than to perform them. However, the collaboration is needed from stakeholders and other staff that do not work for the project manager. These factors point to the communication as an essential skills for project success (Kappelman et al., 2006).

2.3.7 Monitoring and Evaluation of Performance

Monitoring is a continuous process used to keep track the progress of project whereas evaluation is a periodic activity used to assess whether the performance of an activity or a project has achieving its intended goals. The fast changing and developing in IT environment has becomes a challenge for IT projects. Therefore, monitoring and evaluation of IT project's performance is important because new projects might continually use little known technologies. Mahaney and Lederer (2010) stated that the purposes of monitoring are ensure that a project is progressing within acceptable budget, schedule and quality expectations; supports decision as well as confirms subjective assessments. Ngai et al. (2008) stated that the monitoring and evaluation of performance is a critical success factor for any IT system. Hence, implementation progress must be measured periodically for effective control.

2.4 CHALLENGES IN IT PROJECTS

"Failure teaches succeed". Before reaching to success, there is always having some problems or challenges. Hence, it is very important to know the challenges during managing IT projects. There are very little amount of researchers identify the current

challenges on the IT projects especially in Malaysia. Below is some challenges that normally faced by project manager during managing IT projects.

2.4.1 Resources Challenges

Basically, the typical resources challenges faced by any IT project is lack of money, lack of time or lack of information. According to the report of the Royal Academy of Engineering and The British Computer Society (2004), one of the common causes of IT projects fail to deliver the targeted outcomes is inadequate resources. The allocation of sufficient time and resources to correct the errors that emerge during the project is important. As a result, the project's total budget cost will be greatly exceeded the expected cost if failure to devote resources when requires.

2.4.2 Capability-related Challenges

An IT project requires capable person to handle especially when problems are occurred. Poor troubleshooting skills of workers or technician cannot solve the problems arise in the project may lead to project failure. Inadequate of IT development capability or project champion can also lead to project failure. Quality of the final outcomes also might be compromised. The report of Royal Academy of Engineering and The British Computer Society (2004) also stated that lack of skills and proven approach to project management and risk management are one of the common causes to project failure.

2.4.3 Attitude-related Challenges

Top management support is important for a project to success (Young and Jordan, 2008). Lack of top management engagement is therefore becomes a challenge in IT projects. Lack of awareness towards the possible risks is also one of the challenges in IT projects. Some hinder risks will bring serious negative impacts to the IT project if they really happened.

2.5 EFFECTIVENESS OF CRITICAL FACTORS IN IT PROJECTS

There are lacks of researcher study about the effectiveness of critical success factors towards the IT project success. However, it is important to know about the effectiveness of each factor towards the IT project success. So, IT companies can priorities or focus on the most effective factor and develop strategies to make the IT project success.

Mahaney and Lederer (2010) founds that monitoring project helps to reduce shirking which is poor focus and loafing. Besides that, one of the critical success factors towards IT project success is top management support. Effective executive involvement can significantly improve project success (Zwikael, 2008). Top management support has a positive influence on project success and it have particular impact on project success in different industries and countries (Zwikael, 2008). According to the research of Nah et al. (2009), chief executive officers rated top management support, project champion, project management and change management program and culture as most important factor to ERP implementation process. Each factor has a significant effect to the IT project success.

2.6 THEORETICAL FRAMEWORK

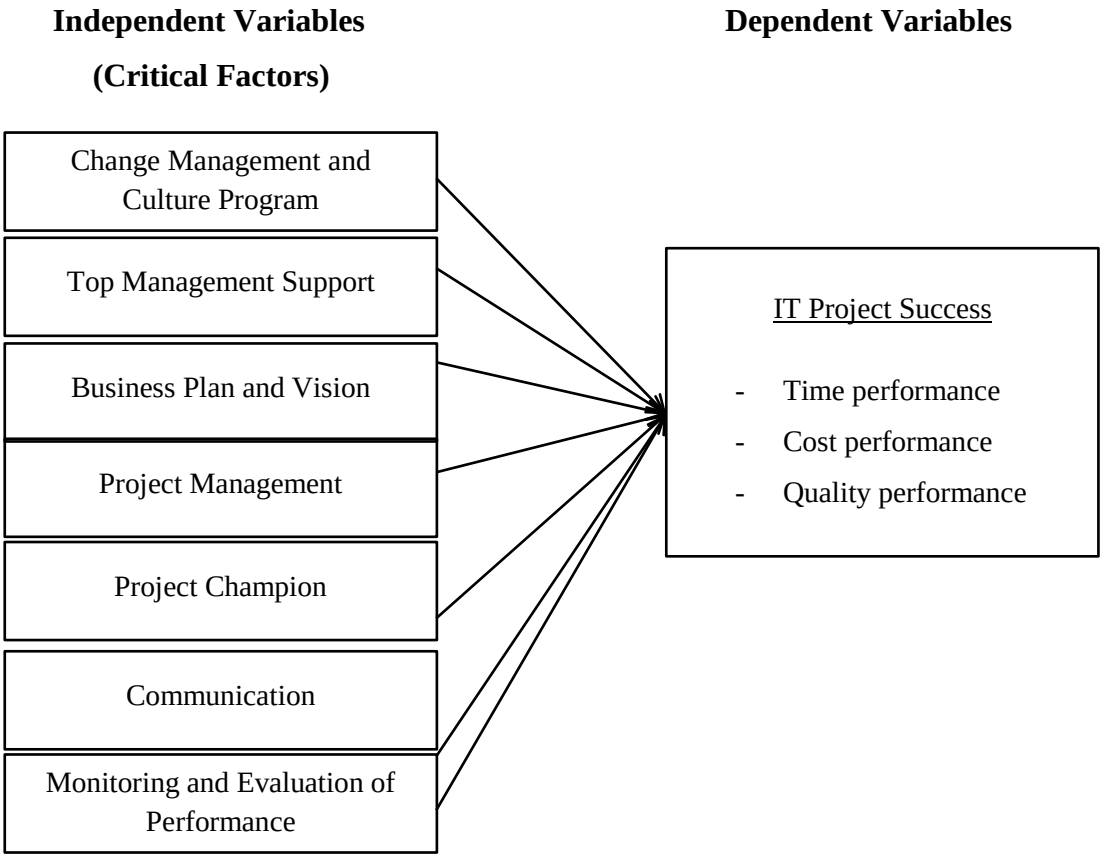

Figure 2.3: Theoretical framework that conceptualized relationships among variables

2.7 SUMMARY

In conclusion, there are seven critical success factors that are highly cited and used by researcher in their study. Among the critical success factors, top management support is agreed by most researchers in their study. The theoretical framework shows the relationship between critical factors and IT project success. In order to enhance the IT projects in Malaysia, challenges should be identified and overcome by project managers.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to describe the most suitable methods of investigation, the nature of the research instruments, types of data and the sampling plan. This chapter will explains about research design, research method, population and sampling and data collection techniques.

3.2 RESEARCH DESIGN

According to Stangor (2007), a research design is the specific method used by a researcher in the process of collect, analyze, and interpret data. The research design use in this study is descriptive research. This type of research answer questions about the current state of affairs and it provides a "snapshot" of thoughts or behaviors at a specific time and place. The descriptive research using in this study is quantitative research. It uses more formal measures of behavior, including systematic observation of behavior and questionnaires, which are designed to be subjected to statistical analysis (Stangor, 2007). Questionnaires method is being used in this study because it generally involves in the gathering of limited data from a large number of cases at a particular time scheduled.

One of the advantages of doing descriptive research is it attempts to capture the complexity of everyday behavior. Basically, it is relatively quick to collect information using a questionnaire. The significant of survey research is it provides information for

further research, possibly of an experimental nature, which can contribute to the establishment of some theory (Awang et al., 2008). The questionnaire is developed to directly address the goals of the study and thus the process of data collection can be completed in short period of time.

3.3 POPULATION AND SAMPLING

3.3.1 Population

The population of this study is refers to the "InfoTech" companies group in the MSC online database (accessible online at http://www.mscmalaysia.my/status_company) that are located at Kuala Lumpur and Selangor. Actually, there are five different groups or clusters of MSC Malaysia status companies. However, only InfoTech is chosen as the population because the companies are related or mainly doing IT projects. Then, other groups of companies such as Institute and Higher Learning and Incubators are not closely relevant to IT projects. There are around 1300 of companies registered under the InfoTech group in the online database. The online database of MSC Malaysia is being referred because MSC Malaysia is the largest Malaysian's information technology industry and it successfully transformed the information and communications technology (ICT) industry in Malaysia.

3.3.2 Sampling

3.3.2.1 Sample Size

It is very important to determine a sample size because samples that are too small will affect the validity of results whereas samples that are too large may lead to resources wastage. According to Hill (1998), samples of 30 or more are recommended in most ex post facto and experimental research because it can achieve the benefits of central limit theorem. One of the approaches to determine the sample size is imitating a sample size of similar studies. Baccarini and Collins (2003) have identified 15 critical success factors for project success through a survey on 150 respondents. 15 percent of

the respondents are working in IT industry. Therefore, the targeted sample size for this research is set on 100 respondents.

3.3.2.2 Sampling Method

The sampling method used by this research is simple random sampling. This method is easy to implement and analyze. The method allows researchers to use statistical methods to analyze sample results because non-random sampling methods are not appropriate for doing statistical analysis. First, IT companies under the group InfoTech and located at Kuala Lumpur and Selangor are extracted manually and recorder in an Excel file. Since each company has a number or code in Excel file, then an online Stat Trek's random number generator is used to obtain simple random samples. As a result, this helps to prevent any biases come from the researcher.

3.4 DATA COLLECTION TECHNIQUES/ METHODS

In this study, a quantitative research approach will be developed, while a cross-sectional research method will be adopted. Cross-sectional investigation implicates the gathering of information, only once, and it is comparatively easy to perform, requires low cost as well as produces quick results (Low, 1970). In this study, IT personnel are targeted respondents because they are the persons who manage the IT projects. Hence, they are more reliable to answer the relevant questions.

There are three types of data collection method will be used in this research. They are posting questionnaire, walk-in survey and mailing method. The first step of collecting data is to contact the chosen respondents and getting confirmation for conducting research. The method use for each respondent is depends on the convenience of respondent and researcher. For the posting method, a questionnaire form will be sent along with a cover letter and self-addressed stamped return envelope to the respondents. The posting questionnaire method is chosen because it saves money in terms of travelling, while collect data covering a wide geographic area (Sekaran, 2003). If the company is prefer for a visit, and then walk-in survey will be used with an early appointment. Besides that, respondents can easily read through and answer the question

by using this method. Another method used is mailing via online browser. This method is being chosen because it can be easily access by respondents. It is also secured as it can only access by the owner of the mailing account. Thus, it can prevent other person to fill in the form and ensure the reliability of the result. Lastly, confidentiality of respondents is essential and will be promised in order to make sure they will respond honestly to the questionnaires.

3.5 DATA ANALYSIS METHOD

After data is collected, they will be analyzed by using the computer software known as Statistical Package for the Social Sciences (SPSS). The responses of the structured close-ended questions will be rated in percentage form. Descriptive statistical analysis will be used to analyze the research data. Its function is to describe, organize, summarize, and present raw data by using numbers, charts, tables or graphs.

Next, Cronbach's Alpha will be used to examine the reliability of the collected data. Besides that, normality test is used in this research to determine whether the data set is well-modeled, normal or not. Correlation analysis will also conduct to test the hypothesis. According to the University of the West England (2007), Pearson correlation coefficient is a technique used to measure the degree of association between two variables and the value will be located between -1.0 to 1.0. Lastly, regression analysis will be conducted to test the hypotheses and the relationship between independent variables and dependent variable.

CHAPTER 4

DATA ANALYSIS

4.1 INTRODUCTION

This chapter presents the results of the survey where collected data were analyzed by using SPSS software. Firstly, demographic variables and descriptive analysis of the respondents are presented. Then, it is followed by reliability test and normality test to determine the reliability of the questionnaires and test the data whether it is or not normally distributed. Mean and ranking for challenges towards critical success factors of IT projects and effectiveness of critical success factors were analyzed in order to understand the intensity of the challenges and effectiveness. Lastly, Pearson correlation coefficient was conducted to measure how strong and kind of the relationship between independent variables and dependent variables.

In this research, a total of 180 questionnaires were distributed directly to several IT companies with MSC status (under category of InfoTech) that are located at Selangor and Kuala Lumpur. The respondent or the companies are randomly picked. The ways of distributing questionnaires are conducted through email with calling or walk-in survey with an early appointment.

The target number of respondents is 100. Unfortunately, there are only 73 sets of questionnaires are collected back successfully. However, only 67 questionnaires are valid for data analysis because 6 of them were incomplete. As a result, a total of 67 completed questionnaires or 37% of response rate were collected and been used for data analysis. According to Hill (1998), samples of 30 or more are recommended in most ex

post facto and experimental research because it can achieve the benefits of central limit theorem. Therefore, 67 of collected questionnaires are acceptable for this research.

4.2 DEMOGRAPHIC ANALYSIS

In this section, descriptive analysis have been carried out to determine mean of age, gender, position, years in current position, organization establishment and experience in IT project or IT industry. It also determines the mode, median, standard deviation, frequency as well as percentage of each element in the demographic part.

Table 4.1: Frequency of the demographic data

Item	Frequency	Percentage (%)
Age		
i. 21-25	10	14.9
ii. 26-30	20	29.9
iii. 31-35	21	31.3
iv. 36-40	10	14.9
v. 41-45	4	6.0
vi. 46-50	2	3.0
Gender		
i. Male	41	61.2
ii. Female	26	38.8
Position		
i. IT Project Manager	14	20.9
ii. IT Executive	15	22.4
iii. IT Administrator	15	22.4
iv. Others	23	34.3
Years in Current Position		
i. Below 2 Years	23	34.3
ii. 2-5 Years	35	52.2
iii. More than 5 Years	9	13.4

Table 4.1: Continued

Item	Frequency	Percentage (%)
Organization Establishment		
i. Below 2 Years	6	9.0
ii. 2-5 Years	19	28.4
iii. More than 5 Years	42	62.7
Experience in IT Project/ Industry		
i. Below 2 Years	15	22.4
ii. 2-5 Years	33	49.3
iii. More than 5 Years	19	28.4

Table 4.2: Statistics of the demographic data

Item	Mean	Median	Mode	Standard deviation
Age	2.76	3.00	3	1.232
Gender	1.39	1.00	1	0.491
Position	2.70	3.00	4	1.155
Years in current Position	1.79	2.00	2	0.664
Organization establishment	2.54	3.00	3	0.659
Experience in IT project/ industry	2.06	2.00	2	0.715

Table 4.1 and 4.2 show frequencies, percentage and statistics of the demographic data respectively.

4.2.1 Respondents' Age

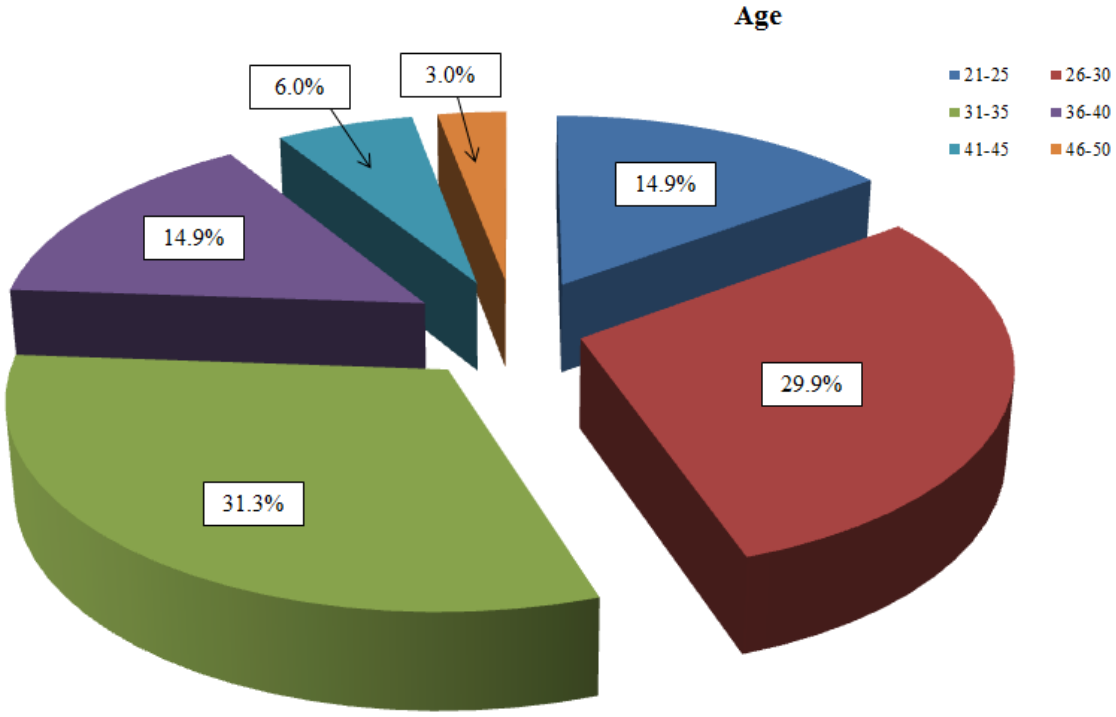

Figure 4.1: Respondents' age

According to figure 4.1, most of the respondent are came from class 31-35 years old and 26-30 years old. 31-35 years old has the highest frequency with 21 respondents or 31.3% from the overall number of respondents. The mode of respondents' age is 3 where it represents respondents from class 31-35 years old in the SPSS software. Meanwhile, respondents' age that between 36-40 years old also consist of 10 person or 14.9% from the overall number of respondents. The lowest number of respondent's class is located on 46-50 years old where it only consist of 2 person or 3 % from the overall number of respondents.

4.2.2 Respondents' Gender

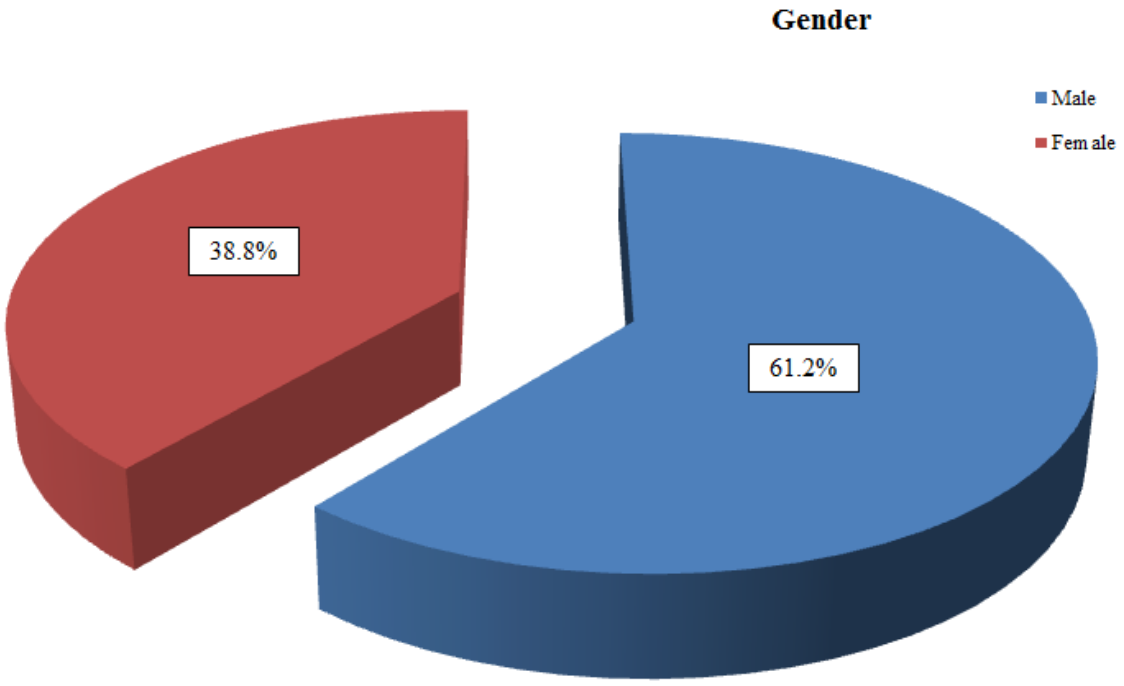

Figure 4.2: Respondents' gender

From figure 4.2, more than half of the respondents are male that yield 61.2% with 41 respondents. On the other hand, female respondents contributes 38.8% which equivalent to 26 respondents. The median and mode are equal to 1 which indicates to male respondents in the SPSS software.

4.2.3 Respondents' Position

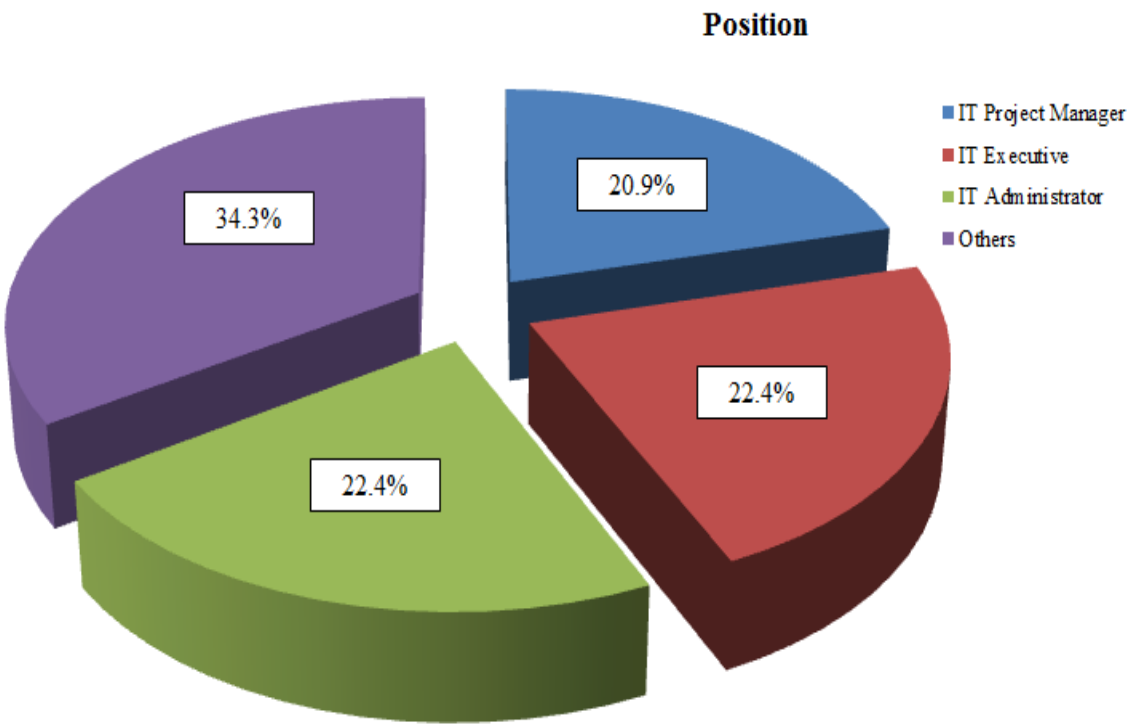

Figure 4.3: Respondents' position

According to the figure 4.3, major respondents are from other position rather than position stated in the questionnaire. This class contributes 34.3% and equivalent to 23 respondents. For example, software manager, financial manager, marketing manager and so forth are consist in the class of others position. Next, both IT executive and IT administrator are having the same amount of respondents which is 15 respondents or 22.4% of the total number of respondents. Lastly, 14 out of 67 respondents are IT project manager which is equivalent to 20.9%. The mean and standard deviation obtained are 2.70 and 1.155 respectively.

4.2.4 Years in Current Position

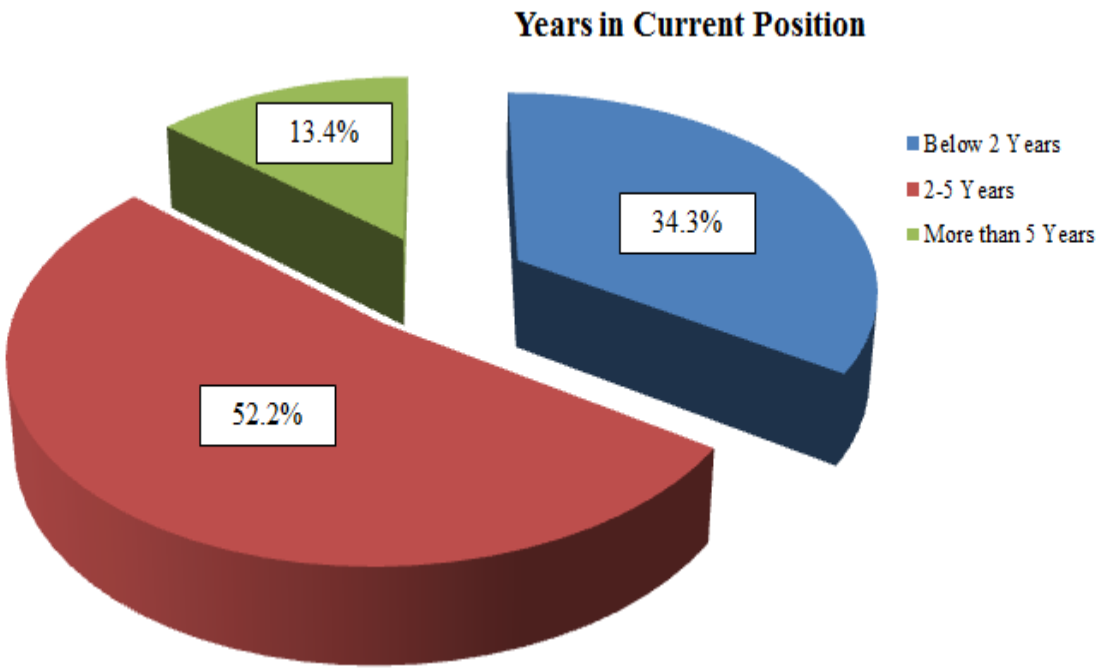

Figure 4.4: Years in current position

Figure 4.4 shows that most of the respondents are having at least 2-5 years working experience in their current position. There are 35 respondents or 52.2% from this category. There is a benefit of getting more respondent from this category because they are more understand about their company's operations compared to new employees. Then, category below 2 years consists of 23 respondents or 34.3% whereas category more than 5 years has the least frequency with 9 respondents or 13.4%.

4.2.5 Organization Establishment

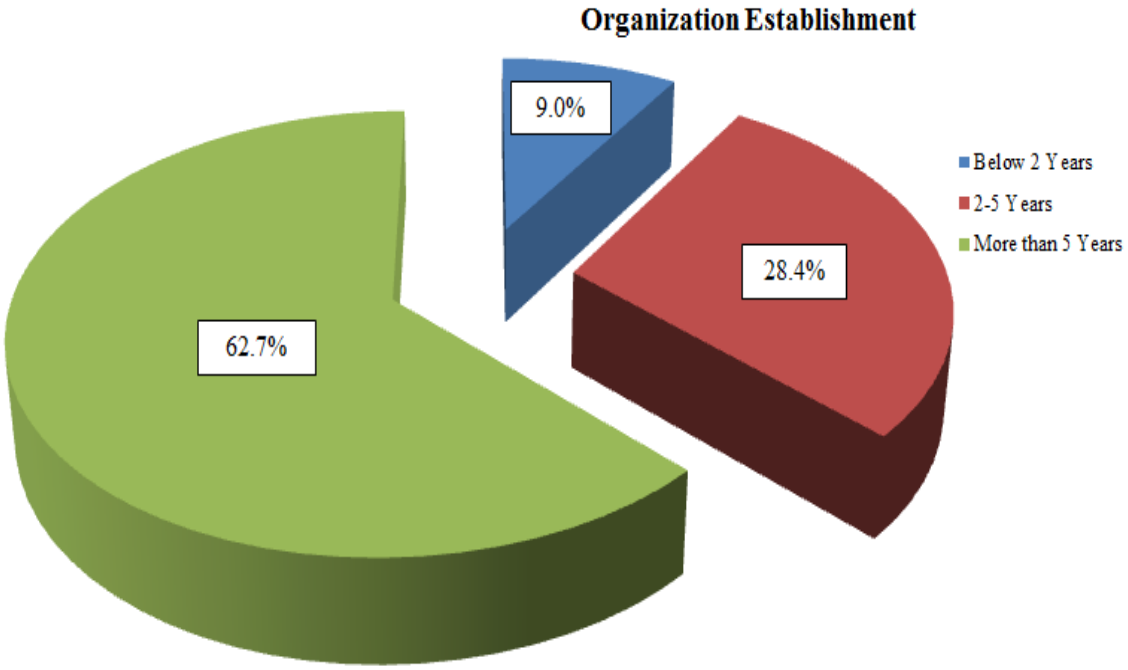

Figure 4.5: Respondents' organization establishment

The mode obtained for organization establishment is 3 where it indicates category more than 5 years in SPSS software. Therefore, most of the respondents' company had established more than 5 years. The frequency of organization established more than 5 years is 42 with 62.7% of the overall respondents' company. This is followed by 2-5 years of organization establishment with a value of 19 respondents that equivalent to 28.4%. Lastly, below 2 years establishment only consist of 6 respondents with a percentage of 9.0%.

4.2.6 Experience in IT Projects/ Industry

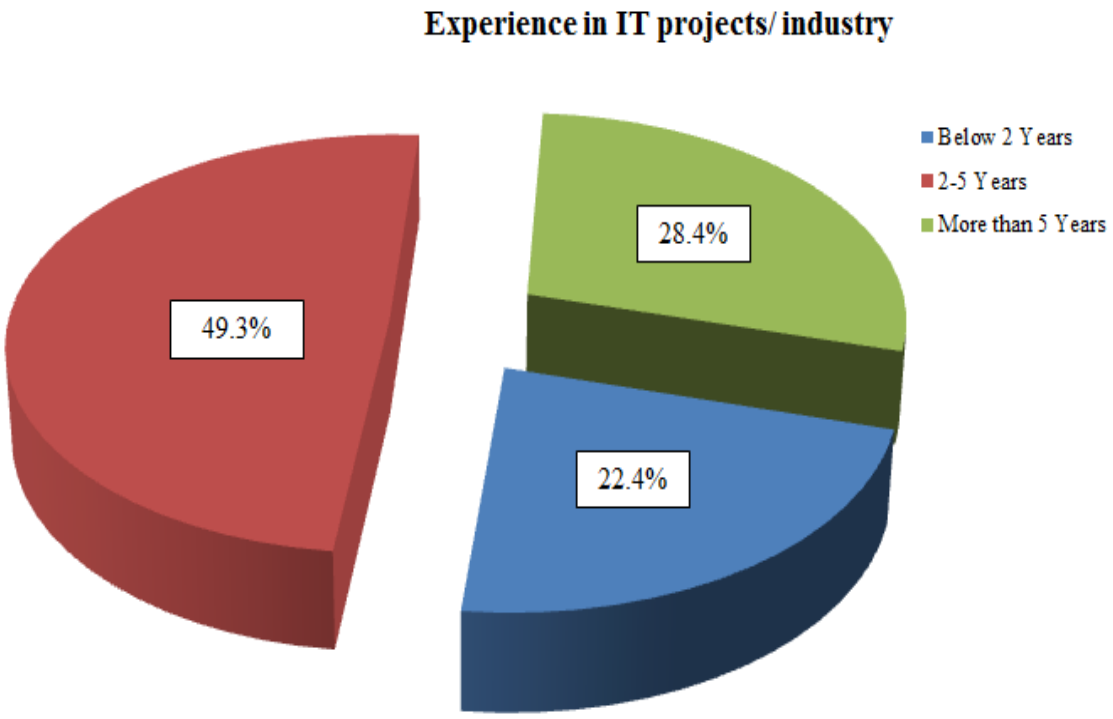

Figure 4.6: Respondents' experience in IT projects/ industry

In accordance to figure 4.6, the highest frequency from the experience in IT project or industry is 33 respondents with 2-5 years' experience that equivalent to 49.3%. It is followed by 19 respondents with more than 5 years' experience (28.4%) and 15 respondents with less than 2 years' experience (22.4%). The mean is equal to 2.06 and hence respondents have an average of 2-5 years working experience in IT project or IT industry.

4.3 RELIABILITY ANALYSIS

The meaning of reliability is refers to the consistency and stability in the results of a test or questionnaire. A questionnaire is reliable if it achieved similar results in repeated administrations. At the same time, there will be no changes to the attribute being measured in the period between measurements. It is also known as "Pilot Test". Reliability analysis should be done if we adapt other researcher's questionnaires or we created our own questionnaires. According to Glick and Fiske (1996), whole scale

should be accepted if we using an accepted scale obtained from a published source. Even if it has problems, changing the scale is not suitable as we will unable to compare our results to the researcher's results that have used the scale.

In this research, Cronbach's Alpha is determined to analyze the reliability of questionnaires. Cronbach's alpha is a statistic that used for identifying the internal consistency of a questionnaire (Bland and Altman, 1997). It is expressed as a number between 0 and 1. According to Norušis (2005), the acceptable value of Cronbach's Alpha is more than or equal to 0.7. However, Cronbach (1951) mentioned that the value of Cronbach's alpha that more than or equal to 0.6 is sufficient to be accepted, especially in the early stages of research. In this research, the acceptable boundary of Cronbach's alpha has been set at the value of 0.6.

Table 4.3: Reliability analysis on critical factors in IT projects

Critical Factors	N of items	Items deleted	Cronbach's alpha
Change management and culture program	3	-	0.783
Top management support	3	-	0.850
Business plan and vision	3	-	0.909
Project Management	3	-	0.754
Project Champion	3	-	0.846
Communication	3	-	0.898
Monitoring and evaluation of performance	3	-	0.600
Overall critical factors (All items of critical factors)	21	-	0.940

There are 7 independent variables or critical factors have been analyzed and none of the items have been deleted. Business plan and vision achieved highest value of reliability that is equal to 0.909. Next, top management support, project champion and communication are successfully to achieve good value of Cronbach's alpha which is

0.850, 0.846 and 0.898 respectively. Meanwhile, change management and culture program, project management, and monitoring and evaluation of performance are successfully passed the acceptable boundary with the value of 0.783, 0.754 and 0.600 respectively. Among the critical factors, monitoring and evaluation of performance has the lowest value of Cronbach's alpha and it is just same as the value of acceptable boundary. This is due to the negative average covariance among items. However, reliability test for overall critical factors achieve excellent internal consistency with a value of 0.940.

Table 4.4: Reliability test on criteria of IT project success

Criteria	N of items	Items deleted	Cronbach's alpha
Time performance	3	-	0.659
Cost performance	3	-	0.693
Quality performance	3	-	0.614
Overall criteria (All items for IT project success)	9	-	0.855

Based on table 4.4, all criteria of IT project success had successfully passed the acceptable boundary and none of the items have deleted. Cost performance has the highest value of Cronbach's alpha among the three criteria with a value of 0.693. On the other hand, quality performance achieved 0.614 for its Cronbach's alpha value and therefore represents the lowest value among all criteria.

All of the criteria do not achieve excellent internal consistency. Test length and dimensionality can affect the value of alpha. According to Tavakol and Dennick (2011), a low value of alpha appears could be due to poor interrelatedness, heterogeneous construct or a low number of questions asked. When all IT project success items tested together, the value of Cronbach's alpha increased to 0.855. As a result, both critical factors and IT project success criteria have passed the reliability test.

4.4 NORMALITY TEST

Normal distributions also known as “bell-shaped curve” or “Gaussian curve” where it’s mean value is equal to 0 and with a standard deviation of 1. Normality test is a technique used to determine whether or not a data set is normally distributed. There are a number of statistical tests can be used to test normality but skewness and kurtosis was chosen for this research.

Skewness is the tilt and refers to asymmetry of the distribution. Right skew is the most common type where its asymmetric tail points out to the right. On the other hand, the less common type is left skew, where the asymmetric tail is points left (Garson, 2012). Kurtosis gives us information about the “peakedness” of a distribution. Negative kurtosis indicates that are many cases located on the tails of the distribution whereas positive kurtosis means too few cases on the tails. According to Garson (2012), the test statistic for both skewness and kurtosis should be within -2 to +2 for concluding the data sets are normally distributed.

4.4.1 Critical Factors in IT Projects

Table 4.5: Skewness and kurtosis of critical factors in IT project

Descriptive Statistics

	N	Mean	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error
Change management and culture program	67	.074737	.191	.293	-.185	.578
Top management support	67	.073803	-.587	.293	1.112	.578
Business plan and vision	67	.075625	-.020	.293	.157	.578
Project management	67	.067341	-.344	.293	.624	.578

Table 4.5: Continued

Project champion	67	.077118	.019	.293	.221	.578
Communication	67	.077293	-.390	.293	.277	.578
Monitoring and evaluation of performance	67	.066591	.086	.293	-.241	.578
Valid N (listwise)	67					

Based on table 4.5, test statistic for both skewness and kurtosis is calculated and arranged at table 4.6. The formula for test statistic of both skewness and kurtosis is statistic divide by standard error.

Table 4.6: Test statistic of skewness and kurtosis for critical factors in IT projects

Critical factors	Test statistic (Skewness)	Test Statistic (Kurtosis)
Change management and culture program	0.652	-0.320
Top management support	-2.003	1.924
Business plan and vision	-0.068	0.272
Project management	-1.174	1.080
Project champion	0.065	0.382
Communication	-1.331	0.479
Monitoring and evaluation of performance	0.294	-0.417

Based on table 4.6, all critical factors are normally distributed because all of their test statistic on skewness and kurtosis are within the range of -2 to +2. Among the critical factors, project champion is the most normal factor because its test statistics values are close to zero. Business plan and vision also distributed normally with the value of -0.068 and 0.272 for test statistic on skewness and kurtosis respectively. Then, change management and culture program, project management, communication, and

monitoring and evaluation of performance are also normally distributed but their test statistics values are more far from zero compared to project champion and business plan and vision. Lastly, top management support is less normal compared to other critical factors because its values of tests statistics are near the boundaries of the acceptable range.

4.4.2 Criteria of IT Project Success

Table 4.7: Skewness and kurtosis of criteria of IT project success

Descriptive Statistics

	N	Mean	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error
Time performance	67	.068692	-.335	.293	-.124	.578
Cost performance	67	.064229	-.237	.293	.320	.578
Quality performance	67	.059469	-.467	.293	.117	.578
Valid N (listwise)	67					

Table 4.8: Test statistic of skewness and kurtosis for criteria of IT project success

Criteria	Test statistic (Skewness)	Test Statistic (Kurtosis)
Time performance	-1.143	-0.215
Cost performance	-0.809	0.554
Quality performance	-1.594	0.202

The results of test statistic of skewness and kurtosis shows in table 4.8 had proved that all criteria of IT project success are normally distributed. All the values are located within the acceptable range. Distribution of cost performance is more normal

compared to others criteria because its test statistic for skewness and kurtosis is more close to zero with a value of -0.809 and 0.554 respectively.

4.5 PEARSON CORRELATION ANALYSIS

In this research, correlation is used for investigating the relationship between two quantitative, continuous variables, which are critical factors and IT project success criteria. The main result of this analysis is the correlation coefficient (r). It has ranges from -1.0 to +1.0. There will be no relationship between the variables if r is close to zero. Then, p-values evaluate how well the sample data likely or unlikely with a true null. As a result, there is a strong evidence against the null hypothesis if p-value is less than or equal to 0.05 (Rumsey, 2011).

Table 4.9: The Pearson values of each variable

		Time performance	Cost performance	Quality performance
Change management and culture program	Pearson Correlation	.148	.165	.136
	Sig. (1-tailed)	.116	.091	.136
	N	67	67	67
Top management support	Pearson Correlation	.664**	.406**	.461**
	Sig. (1-tailed)	.000	.000	.000
	N	67	67	67
Business plan and vision	Pearson Correlation	.479**	.393**	.360**
	Sig. (1-tailed)	.000	.000	.001
	N	67	67	67

Table 4.9: Continued

Project management	Pearson Correlation	.371**	.380**	.341**
	Sig. (1-tailed)	.001	.001	.002
	N	67	67	67
Project champion	Pearson Correlation	.299**	.338**	.134
	Sig. (1-tailed)	.007	.003	.140
	N	67	67	67
Communication	Pearson Correlation	.395**	.410**	.277*
	Sig. (1-tailed)	.000	.000	.012
	N	67	67	67
Monitoring and evaluation of performance	Pearson Correlation	.463**	.372**	.372**
	Sig. (1-tailed)	.000	.001	.001
	N	67	67	67

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

In Pearson correlation analysis, the positive relationship is at level of significant of 5%. The results showed that there is a positive significant relationship between all independent and dependent variables since $p < 0.05$ except of change management and culture program towards time, cost and quality performance; and project champion towards quality performance. Therefore, change management and culture program does not affect IT project success. Meanwhile, project champion does not affect quality performance.

Any changes phenomenon occurs on the independent variable will affect the dependent variable. For example, the greater the top management support, the greater the project performance to lead to IT project success. Even the correlation results showed most of the independent variables have positive significant relationship toward dependent variable, but hypotheses of this research will be investigated more specifically through regression analysis.

4.6 REGRESSION ANALYSIS

Regression analysis is conducted to test the hypotheses and the relationship between independent variables and dependent variable. The data of the hypotheses testing will be attached in the Appendix C.

Table 4.10: Summary of multiple linear regressions

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.863	7	0.838	7.341	0.000 [b]
Residual	6.731	59	0.114		
Total	12.594	66			

a. Dependent Variable: IT Project Success
b. Predictors: (Constant), Monitoring and evaluation of performance, Business plan and vision, Change management and culture program, Communication, Project champion, Project management, Top management support

Table 4.10: Continued

Model	B	Std Error	Beta	t	Sig.
(Constant)	1.397	0.383		3.648	0.001
Change Management and Culture Program	-0.046	0.079	-0.065	-0.587	0.559
Top Management Support	0.291	0.098	0.402	2.964	0.004
Business Plan and Vision	0.191	0.095	0.270	2.002	0.050
Project Management	0.045	0.103	0.056	0.433	0.667
Project Champion	-0.128	0.090	-0.185	-1.432	0.158
Communication	0.044	0.087	0.064	0.507	0.614
Monitoring and Evaluation of Performance	0.167	0.117	0.209	1.427	0.159
Model	**R**	**R Square**	**Adjusted R Square**	**Std Error of the Estimate**	**Durbin-Watson**
1	0.682[b]	0.466	0.402	0.33777	2.172

a. Dependent Variable: IT Project Success
b. Predictors: (Constant), Monitoring and evaluation of performance, Business plan and vision, Change management and culture program, Communication, Project champion, Project management, Top management support

The regression model is tested for all hypotheses (H1 to H7) in this research.

H1: There is a positive significant relationship between change management and culture program and the IT project success.

H2: There is a positive significant relationship between top management support and IT project success.

H3: There is a positive significant relationship between business pan and vision and IT project success.

H4: There is a positive significant relationship between project management and IT project success.

H5: There is a positive significant relationship project champion and IT project success.

H6: There is a positive significant relationship between communication and IT project success.

H7: There is a positive significant relationship between monitoring and evaluation of performance and IT project success.

Based on the regression analysis results, the significance value (p-value) of the entire model is equal to 0.000. In this case, null hypothesis is being rejected because p-value is less than 0.05. Therefore, it shows that at least one independent variable is a significant predictor of the dependent. According to Gaur and Gaur (2006), a value of variance inflation factor (VIF) higher than 5 and tolerance less than 0.2 indicates the presence of multicollinearity. If multicollinearity is present, it is difficult to separate the effects of the individual variables because they provide very similar information. For this research, each VIF is less than 5 and each tolerance is more than 0.2 (appendix C), hence the problem with collinear variables doesn't exist. R square of these variables is 0.466. This indicates that seven independent variable which are change management and culture program, top management support, business plan and vision, project management, project champion, communication, and monitoring and evaluation of performance were able to explain 46.6% of the variance in IT project success.

Next, Durbin-Watson value is 2.172 which indicate that there is no serious autocorrelation problem in the sample. The Beta (β) values shows that project management ($\beta = 0.056$, $p > 0.10$), communication ($\beta = 0.064$, $p > 0.10$) and monitoring and evaluation of performance ($\beta = 0.209$, $p > 0.10$) with IT project success are insignificant. The Beta value of top management support shows that every single time top management supporting their IT project will increase 40.2% of chance towards IT

project success. Meanwhile, business plan and vision has 0.270 of beta value that indicates that if an IT company focus on formulating and executing their business plan and vision, then this will increase 27.0% of chance for their IT project towards success.

However, the negative Beta value showed by change management and culture program at -0.065 and project champion at -0.185 indicates that they have negative relationship towards IT project success. Therefore, hypothesis 1, 4, 5, 6 and 7 are not supported since the analysis does not show positive significant relationship between independent and dependent variables by referring to the F values as 7.341 at 1% significance level. As a result, there are only two hypotheses, H2 and H3, are being supported since top management support and business plan and vision have positive significant relationship towards IT project success.

4.7 RANKING

Frequency test is another measurement used to see which of the challenges and critical success factors contributes the most to IT projects. Mean of each challenges and critical success factors will be determined and ranked accordingly.

4.7.1 Challenges in IT Projects

Table 4.11: Ranking of the challenges in IT projects

Types of Challenges	Mean	Rank	Total Mean	Total Rank
Resources challenges				
1. IT projects normally failed due to lack of money, time or information.	3.28	3	3.45	3
2. Failure to devote resources when needed will cause project exceeding budget and timeline.	3.49	2		
3. Inadequate resources are one of the common situations in IT projects.	3.58	1		

Table 4.11: Continued

Types of Challenges	Mean	Rank	Total Mean	Total Rank
Capability-related challenges				
1. Poor troubleshooting skills of workers prevent project success.	3.42	3	3.61	2
2. Inadequate of IT development capabilities or project champion can lead to project failure.	3.66	2		
3. Lack of skills and proven approach to project management and risk management can lead to project failure.	3.76	1		
Attitude-related challenges				
1. Lack of top management engagement prevent IT project success.	3.54	3	3.69	1
2. Lack of awareness towards the possible risks may lead to IT project failure.	3.76	1		
3. Unconcern about risks will affect the project success.	3.76	1		

Table 4.11 shows the ranking of the challenges in IT projects. Among the types of challenges, attitude-related challenges had achieved highest score of total mean with 3.69 and it has been ranked at first. Next, it is followed by capability-related challenges with 3.61 of total mean. Lastly, the lowest total mean is resources challenges with a score of 3.45. In summary, most of the respondents think neutrally towards all types of challenges since all total mean are below than 4.

4.7.2 Effectiveness of the Critical Factors in IT projects

The mean and rank of effectiveness of the critical success factors in IT projects is showed at table 4.12.

Table 4.12: Ranking of the critical success factors in IT projects

Critical Factor	Mean	Rank
1. Change management and culture program	3.10	7
2. Top management support	4.01	2
3. Business plan and vision	3.96	3
4. Project management	3.93	5
5. Project champion	3.60	6
6. Communication	4.27	1
7. Monitoring and evaluation of performance	3.96	3

According to table 4.12, the highest rank among the critical success factors is communication with mean of 4.27. After that, top management support is ranked number 2 with mean of 4.01. Business plan and vision and monitoring and evaluation of performance having the same mean score, 3.96, and are located at rank 3. Next, project management is rank 5 with mean of 3.93. As a result, most of the respondents agree that communication, top management support, business plan and vision, monitoring and evaluation of performance, and project management are more effective in IT project since their mean score is approximately to 4. On the other hand, project champion and change management and culture program was ranked at number 6 and 7 with mean score of 3.60 and 3.10. Therefore, most of the respondents felt that project champion and change management and culture program are less effective compared to other critical success factors.

4.8 SUMMARY OF FINDINGS

Table 4.13: Summary of entire results of hypotheses testing

Hypothesis		Result
H1	There is a positive significant relationship between change management and culture program and the IT project success	Rejected

Table 4.13: Continued

Hypothesis		Result
H2	There is a positive significant relationship between top management support and IT project success	Accepted
H3	There is a positive significant relationship between business plan and vision and IT project success	Accepted
H4	There is a positive significant relationship between project management and IT project success	Rejected
H5	There is a positive significant relationship project champion and IT project success	Rejected
H6	There is a positive significant relationship between communication and IT project success	Rejected
H7	There is a positive significant relationship between monitoring and evaluation of performance and IT project success	Rejected

Table 4.13 has summarized the overall hypothesis testing result. Cronbach's alpha was used in this research to test the reliability of the variables where its value must greater or equal to 0.6. Besides, Pearson correlation analysis was conducted to show the relationship between independent and dependent variables. Finally, regression analysis was done to test the hypotheses.

Internal consistency testing using Cronbach's alpha shows that all independent and dependent variables are reliable since their value of Cronbach's alpha are more than 0.6. Meanwhile, the overall Cronbach's alpha for independent and dependent variables is 0.940 and 0.855 respectively.

Next, there are all hypotheses in Pearson correlation were accepted since their p-value less than 0.05 except change management and culture program towards time, cost and quality performance; and project champion towards quality performance. Lastly, regression analysis is done to test hypotheses specifically. The results show that only H2 and H3 are being accepted. Therefore, only top management support and business plan and vision have a positive significant relationship with IT project success.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

The main objective of this research is to investigate the relationship between critical success factors and IT project success in Malaysia IT companies. Besides, this research also intended to investigate the challenges and effectiveness of critical success factors in IT projects. This chapter will answer the research questions and elaborate about the findings from last chapter.

5.2 RECAPITULATIONS OF THE RESEARCH

The research objectives and research questions are being discussed in early chapter. Tests are conducted in order to achieve objectives of this research. The objectives of this study were threefold. First, it identified critical success factors in IT projects. The second aim of this research was to investigate the challenges and effectiveness of critical success factors in IT projects. Lastly, this research aim to investigate the relationship between critical success factors and IT project success. In summary, all objectives of this study were successfully achieved.

Objective 1: To identify critical success factors in IT projects

A set of questionnaire was set after referring several related researcher's thesis. Reliability analysis was carried out to check the internal consistency of the critical success factors.

Objective 2: To determine the challenges in IT projects

Frequency test was conducted to observe which of the challenges contributes the most to IT projects. The highest mean score for challenges in IT projects is attitude-related challenges with a mean score of 3.69.

Objective 3: To assess the effectiveness of critical factors in IT projects

Frequency test was conducted to assess the effectiveness of critical factors in IT projects. Communcation is the most effective factor in IT projects with a highest mean score of 4.27.

Objective 4: To investigate the relationship between critical success factors and IT project success

In order to define IT project success, measurement of IT project success was derived as time, cost and quality performance and they were represent dependent variables in this research. Seven (7) hypotheses were developed but only two (2) hypotheses were accepted. Multiple linear regressions were used to test those hypotheses.

5.3 DISCUSSIONS

As mentioned earlier, the main objective of this research is to investigate the relationship between critical success factors and IT project success in Malaysia IT companies. So, this section will further discuss about the main objective. IT project success depends on measurement in terms of time, cost and quality performance. Then, seven critical success factors were adapted to achieve success in IT projects.

5.3.1 Change Management and Culture Program with IT Project Success

Change management and culture program has been proved that it has no positive significance relationship towards IT project success. In Pearson correlation analysis,

change management and culture program has p-value that is more than 0.05. Meanwhile, it gets a negative Beta value in regression analysis. Hence, time, cost and quality performance of an IT project would not be affected if increasing change management and culture program. Among all the critical factors, respondents think that change management and culture program is less effective to IT project success compared to other factors. Implementation of change management and culture program may involve risks and large resources. Pottruck (2014) mentioned that any transformation whether large or small, will ultimately not succeed if the leader has no leadership skills to drive the process forward. Change management can be a continuous process and hence the program may not directly affect to an IT project.

5.3.2 Top Management Support and IT Project Success

Top management support has been proved that it has positive significance relationship towards IT project success. In Pearson correlation analysis, top management support has p-value that is less than 0.05 and it is significant at level of 0.01. Besides, it gets a positive Beta value with p less than 0.10 in regression test. Hence, the more the support from top management, the higher the chance for IT project success. The research conducted by Young and Jordan (2008) provides evidence that top management support is the most important critical success factor for project success because the project stalled when the project sponsor resigned. Furthermore, it is being rated as rank 2 among the critical success factors. This means it is effective to be applied for achieving success in IT projects. In most of the IT projects, top management support is crucial especially on the initiation phase because it requires certain capital, experiences as well as communication with stakeholders.

5.3.3 Business Plan and Vision with IT Project Success

Business plan and vision is another critical factor that has been proved where it has positive significance relationship towards IT project success. In Pearson correlation analysis, its p-value is less than 0.05 and equal to 0.05 for regression test. Therefore, business plan and vision should be focused and used in order to enhance IT projects successful rate. It is being ranked at number 3 where respondent agreed that business

plan and vision is effective to be used to make IT project success. Mirza et al. (2013) concluded in their research that getting back to the basics and define, communicate, and get agreement on a clear vision is required by a company in order to deliver a quality product, within budget and on time that meets customer's expectations.

5.3.4 Project Management and IT Project Success

From the finding, project management has no significant relationship towards IT project success. This is because its p-value is higher than 0.10 in regression test. However, IT project success is positively related to project management. The equation generated from regression analysis is shown at below.

IT project success = 1.397 + (-0.046 x A) + (0.291 x B) + (0.191 x C) +
(0.045 x D) + (-0.128 x E) + (0.044 x F) + (0.167 x G)

Where,

A = Change management and culture program
B = Top management support
C = Business plan and vision
D = Project management
E = Project champion
F = Communication
G = Monitoring and evaluation of performance

From the equation above, it shows that project management has positive related to IT project where implementation of project management increased will increase the chance for IT project success at the same time. The result is consistent with the previous study where Mir and Pinnington (2014) also found that project management is positively correlated to project success. However, project management is not significantly contribute to IT project success based on the result of this research.

5.3.5 Project Champion and IT Project Success

The negative Beta value showed by project champion at -0.185 indicates that it has negative relationship towards IT project success. Theoretically, it means the greater number the project champion, the lower the chance for IT project success. However, it might practically wrong. There are researchers found that project champion can aid significantly in managing IT development (Bowen et al., 2007). So, the difference result on this research maybe caused by the sample size or population data. The largest the sample, the lower the error occur in the research.

5.3.6 Communication and IT Project Success

Communication has no significant relationship towards IT project success. Its p-value is equal to 0.614 which is higher than 0.10. However, it has positively related to IT project success because its Beta value is positive. Effective communication definitely brings benefits to a project. However, it is not significant to make IT project success based on this research's result. Communication may not have big problem in small IT companies and therefore it may only become significant critical factor in big IT companies. Hyväri (2006) founds that communication in project teams is a significant success factor in bigger companies. Indeed, every project needs communication, but if communication is ineffective or information is overloaded, then communication does not help IT project success.

5.3.7 Monitoring and Evaluation of Performance with IT Project Success

Monitoring and evaluation of performance also has no significant relationship towards IT project success. Its p-value is higher than 0.10 which is equal to 0.159. However, both Pearson correlation analysis and regression analysis proved that it has positively related to IT project success. This is consistent with a previous study where Ngai et al. (2008) founds that monitoring and evaluation of performance is positively correlated to the success of any IT systems. Among the factors, it is being ranked as number 3 where it is effective to be used to make IT project success. So, monitoring and

evaluation of performance has positively relationship but not significant to IT project success.

5.3.8 Challenges in IT Projects

Three types of challenges that normally faced by project manager during managing IT projects have been investigated. The highest score of challenges is attitude-related challenges. Although top management support and business plan and vision are positively significant correlated to the IT project success, however attitude of employer and employees are also need to be focused in order to achieve IT project success. Team members should have positive attitude, as this is better for project performance and overall energy and well being of the team (Tanner and Willingh, 2014). The fast changing or developing in IT field make IT projects facing a lot of risk and uncertainty. Most of the respondents think that the attitude of aware and concern on project risk are important in achieving IT project success. Top management engagement should also be sufficient in order to overcome attitude-related challenges. Without a positive attitude on employees as well as employer, the company's business plan and vision cannot be implemented successfully.

5.3.9 Effectiveness of Critical Factors in IT Projects

There are seven (7) critical factors being identified in this research. From the results, most of the respondent think that communication is the most effective critical factor. It is different from the result of correlation and regression. This shows that most of the respondent agree that communication is not contribute much to the IT project success. However, effective communication can help the IT companies in achieving their business plan and vision and enhance the top management engagement with employees. Kappelman et al. (2006) conclude that communication is an essential skills for project success. As a result, IT companies should also have good practices in communication in order to support their business plan and vision, enhance their top management support as well as solving the attitude-related challenges.

5.4 IMPLICATION OF RESEARCH

This research is useful for academic purpose because it enables those people who involve in academic field increase their knowledge and understanding about IT management which can help to enhance project performance. This research also shows that IT companies should giving more top management support and focus on formulating business plan and vision in order to achieve success in their IT projects. By doing this research, the researcher knew how are the IT companies in Kuala Lumpur and Selangor operate or manage their IT projects. It is not easy for a person to manage an IT project because there are many challenges and unexpected risks for fast developing project field. A survey in Malaysia on 2005 founds that 31% of IT projects failed to finish on time and another 31% within budget (Ibrahim et al., 2012). Based on the findings, attitude problem among employees and employers should be solved or avoided because it may bring serious negative impacts to the IT project. Therefore, IT companies should have sufficient top management engagement and aware about the possible risks that may lead to IT project failure.

5.5 LIMITATIONS

The limitations of this research are wide area of collecting data, broad overview, and amount of data collected. Firstly, this research is scoping on IT companies in Kuala Lumpur (KL) and Selangor based on MSC database. There are more than 600 IT companies in KL and Selangor. So, wide area of collecting data may reduce the consistency of data and it requires a lot of time for collecting the data.

Next, this research has only provides a broad overview rather an in-depth analysis. There are several types of IT projects such as software development, ERP system development, computer system design project and so forth. Different project may have different focus criteria and hence their critical success factors might not be the same. Lastly, the amount of data collected is not achieved the target sample size which is only 67 out of 100. It is sufficient since samples of more than 30 and less than 500 are appropriate for most research (Saiful, 2011). However, sampling variability will decreases when the sample size increases. According to Henry (2013), the gain in

precision is greater for each unit increase in the smaller sample size range than larger sample size range.

5.6 RECOMMENDATIONS FOR FUTURE RESEARCH

As discussed in section 5.5, the future research should narrow down the area of collecting data. There are many IT zone in KL and Selangor. For example, Cyberjaya, Petaling Jaya, Putrajaya and so forth. Therefore, it is recommended to choose an IT zone as the research area because wide area of collecting data requires a lot of time and money. Another recommendation for future research is conduct an in-depth analysis. For this research, the respondents' company details are unknown. Hence, it is better to use the data collected from successful IT companies rather than just from the overall data collected. In order to increase response rate, researchers are advised to develop a simple, short and precisely questionnaire. This is because most of the IT personnel are not really willing to spend time out of their working scope during office hours. Therefore, it is difficult to get their response without using simple, short and precisely questionnaire. So, researchers are advised to carry out factor analysis in order to construct a manageable amount of questions and hence increase the validity of questionnaire.

5.7 CONCLUSION

In conclusion, top management support and business plan and vision have positively and significantly affected IT project success. Top management support and business plan and vision can help IT companies to enhance their project performance, Attitude-related challenges should be focused because it has highest total mean among the challenges. Lack of awareness towards the possible risks may lead to IT project failure. Lastly, communication among project team members must be effective and not information overloaded, or else it is not useful to make IT project success.

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APPENDIX A

PROJECT WORK SCHEDULE

TASKS	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1. Discussions on Project Title and Objectives	■	■									
2. Approval of Project Title		■									
3. Collect Information	■	■	■	■							
4. Preparation of Chapter 1: Introduction		■									
5. Preparation of Chapter 2: Literature Review		■	■								
6. Preparation of Chapter 3: Research Methodology			■	■							
7. Develop Questionnaire				■							
8. Finalization & Submission of FYP I				■							
9. Preparation and FYP I Oral Presentation				■							
10. Data Collection				■	■	■	■				
11. Preparation of Chapter 4: Data Analysis								■	■		
12. Preparation of Chapter 5: Conclusion										■	■
13. Finalization & Submission of FYP II											■
14. Preparation and FYP II Oral Presentation											■

APPENDIX B

QUESTIONNAIRE

Faculty of Industrial Management

Title: Critical Success Factors in IT Projects: Challenges and Effectiveness

Name (Optional) : _____

Company : _____

Age : ____ **years old**

Section A: Demographic

This section is for statistical purposes only. Place a tick where appropriate.

1. **Gender**

☐ Male ☐ Female

2. **Position**

☐ IT Project Manager ☐ IT Executive

☐ IT Administrator ☐ Other: _____

3. **Years in Current Position**

☐ Below 2 years ☐ 2-5 years ☐ More than 5 years

4. **Organization Establishment**

☐ Below 2 years ☐ 2-5 years ☐ More than 5 years

5. **Experience in IT Projects/ Industry**

☐ Below 2 years ☐ 2-5 years ☐ More than 5 years

Section B: Critical Factors

For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick in the appropriate box. The response scales is as follows:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Change Management and Culture Program	**1**	**2**	**3**	**4**	**5**
1. Managers are concern about shared values and goals, and willing to accept change if necessary.					
2. Our company preferred periodically organizing change management and culture program.					
3. Our company implements change management and culture program to deal with uncertainties.					

Top Management Support	**1**	**2**	**3**	**4**	**5**
4. Our top management support full implementation of IT project and does not end with initiation.					
5. Our top management always provides enough encouragement and incentives to the team within the IT project.					
6. Managers always allocate appropriate and adequate resources to each IT project.					

Business Plan and Vision	**1**	**2**	**3**	**4**	**5**
7. Our IT projects always consist with an agreed upon and documented vision and plan.					

8. Our company concerns about development of a clear business plan and vision.					
9. Our company will ensure the business plan and vision are completely discussed and developed.					

Project Management	**1**	**2**	**3**	**4**	**5**
10. We focus about project completion date and a project schedule will be set for each IT project.					
11. We using practices or software in managing project budget.					
12. We will define scope for each IT project.					

Project Champion	**1**	**2**	**3**	**4**	**5**
13. We provide a project champion or professional in each IT project.					
14. Project champion or senior manager has power to set goals and legitimize change.					
15. The project champion facilitates and enhances team motivation along with the project.					

Communication	**1**	**2**	**3**	**4**	**5**
16. Our company encourages an open and honest two-way communication of expectations and requirements.					
17. Our company practicing open and honest two-way communication in a consistent way.					
18. Feedbacks from employees and project team members are collected and managers are willing to listen on their opinions.					

Monitoring and Evaluation of Performance	**1**	**2**	**3**	**4**	**5**
19. Our company set milestones to each IT project for measuring progress against goals.					
20. Manager has periodically monitoring and evaluating project team members and project progress.					
21. Results of evaluation will be used for improve employee's performances and rewards or recognition will be given to those with good results.					

Section C: IT Project Success

For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick in the appropriate box. The response scales is as follows:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Time Performance	**1**	**2**	**3**	**4**	**5**
22. At the end of projects, projects were accomplished within the scheduled or no delays are occurred.					
23. Project's schedule variances always show positive value within Projects.					
24. There is **minimal adjustment** of project schedules during the execution of projects.					

Cost Performance	**1**	**2**	**3**	**4**	**5**
25. At the end of projects, the projects' total cost is within the given or targeted budget.					

26. Cost variances of projects always show positive value within the projects.					
27. The project is profitability as revenues generated by firm exceeding the cost of producing the revenues.					

Quality Performance	**1**	**2**	**3**	**4**	**5**
28. Projects always met the requirements of each stakeholder.					
29. Projects have always achieved its targeted scope and goals.					
30. Project absence of any legal claims and proceedings.					

Section D: Challenges towards Critical Success Factors of IT Projects

For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick in the appropriate box. The response scales is as follows:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Resources Challenges	**1**	**2**	**3**	**4**	**5**
31. IT projects normally failed due to lack of money, time or information.					
32. Failure to devote resources when needed will cause project exceeding budget and timeline.					
33. Inadequate resources are one of the common situations in IT projects.					

Capability-related Challenges	**1**	**2**	**3**	**4**	**5**
34. Poor troubleshooting skills of workers prevent project success.					
35. Inadequate of IT development capabilities or project champion can lead to project failure.					
36. Lack of skills and proven approach to project management and risk management can lead to project failure.					

Attitude-related Challenges	**1**	**2**	**3**	**4**	**5**
37. Lack of top management engagement prevent IT project success.					
38. Lack of awareness towards the possible risks may lead to IT project failure.					
39. Unconcern about risks will affect the project success.					

Section E: Effectiveness of Critical Success Factors towards IT Project Success

Please evaluate each of the following factors in terms of effectiveness in determining success in IT projects.

1 = Not at All Effective

2 = Slightly Effective

3 = Somewhat Effective

4 = Very Effective

5 = Extremely Effective

Critical Success Factor	**1**	**2**	**3**	**4**	**5**
40. Change Management and Culture Program					
41. Top Management Support					
42. Business Plan and Vision					
43. Project Management					
44. Project Champion					

45. Communication					
46. Monitoring and Evaluation of Performance					

Please attach a company stamp or signature, your email and date here to validate the participation in answering the question.

_____

(Signature/ Official Stamp)

Name :

Date :

Email :

-END OF QUESTIONNAIRE-

THANK YOU

APPENDIX C

LIST OF ANALYSIS RESULTS

1. Respondents' Profile Statistics

		Gender	Age	Position	Years In Current Position	Organization Establishment	Experience
N	Valid	67	67	67	67	67	67
	Missing	0	0	0	0	0	0
Mean		1.39	2.76	2.70	1.79	2.54	2.06
Median		1.00	3.00	3.00	2.00	3.00	2.00
Mode		1	3	4	2	3	2
Std. Deviation		.491	1.232	1.155	.664	.659	.715

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-25	10	14.9	14.9	14.9
	26-30	20	29.9	29.9	44.8
	31-35	21	31.3	31.3	76.1
	36-40	10	14.9	14.9	91.0
	41-45	4	6.0	6.0	97.0
	46-50	2	3.0	3.0	100.0
	Total	67	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	41	61.2	61.2	61.2
	Female	26	38.8	38.8	100.0
	Total	67	100.0	100.0	

Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	IT Project Manager	14	20.9	20.9	20.9
	IT Executive	15	22.4	22.4	43.3
	IT Administrator	15	22.4	22.4	65.7
	Others	23	34.3	34.3	100.0
	Total	67	100.0	100.0	

Years in Current Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 2 Years	23	34.3	34.3	34.3
	2-5 Years	35	52.2	52.2	86.6
	More than 5 Years	9	13.4	13.4	100.0
	Total	67	100.0	100.0	

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 2 Years	15	22.4	22.4	22.4
	2-5 Years	33	49.3	49.3	71.6
	More than 5 Years	19	28.4	28.4	100.0
	Total	67	100.0	100.0	

Organization Establishment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 2 Years	6	9.0	9.0	9.0
	2-5 Years	19	28.4	28.4	37.3
	More than 5 Years	42	62.7	62.7	100.0
	Total	67	100.0	100.0	

2. Reliability Analysis

Reliability Statistics

(Critical Factors)

Cronbach's Alpha	N of Items
.940	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	78.82	131.364	.687	.936
Q2	79.73	132.418	.618	.937
Q3	79.45	135.473	.474	.939
Q4	79.00	127.400	.740	.935

Q5	79.27	131.618	.653	.936
Q6	79.45	126.673	.752	.935
Q7	79.45	127.473	.714	.935
Q8	79.09	128.291	.729	.935
Q9	79.18	131.964	.686	.936
Q10	78.91	135.091	.495	.939
Q11	79.09	136.691	.617	.938
Q12	79.27	129.618	.764	.935
Q13	79.45	131.673	.591	.938
Q14	79.27	136.418	.394	.941
Q15	79.55	132.273	.547	.938
Q16	78.82	130.364	.744	.935
Q17	79.09	128.691	.816	.934
Q18	79.00	134.800	.453	.940
Q19	79.55	135.873	.437	.940
Q20	79.00	133.600	.611	.937
Q21	79.18	127.964	.791	.934

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
83.18	144.764	12.032	21

Reliability Statistics

(IT Project Success Criteria)

Cronbach's Alpha	N of Items
.855	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q22	27.18	22.164	.725	.828
Q23	26.91	20.891	.713	.826
Q24	28.00	23.000	.335	.874
Q25	27.00	22.600	.749	.828
Q26	27.27	21.418	.553	.845
Q27	26.73	22.018	.682	.830
Q28	26.73	21.818	.712	.828
Q29	26.55	22.473	.677	.832
Q30	26.55	25.273	.267	.867

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
30.36	27.855	5.278	9

3. Normality Test

Descriptive Statistics

	N	Mean	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error
Change management and culture program	67	.074737	.191	.293	-.185	.578
Top management support	67	.073803	-.587	.293	1.112	.578
Business plan and vision	67	.075625	-.020	.293	.157	.578
Project management	67	.067341	-.344	.293	.624	.578
Project champion	67	.077118	.019	.293	.221	.578
Communication	67	.077293	-.390	.293	.277	.578
Monitoring and evaluation of performance	67	.066591	.086	.293	-.241	.578
Valid N (listwise)	67					

Descriptive Statistics

	N	Mean	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error
Time performance	67	.068692	-.335	.293	-.124	.578
Cost performance	67	.064229	-.237	.293	.320	.578
Quality performance	67	.059469	-.467	.293	.117	.578
Valid N (listwise)	67					

4. Regression Analysis

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Monitoring and evaluation of performance, Business plan and vision, Change management and culture program, Communication, Project champion, Project management, Top management support[b]	.	Enter

a. Dependent Variable: IT Project Success

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Std. Error of the Estimate	Durbin-Watson
1	.682[a]	.466	.33777	2.172

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.863	7	.838	7.341	.000[b]
	Residual	6.731	59	.114		
	Total	12.594	66			

a. Dependent Variable: IT Project Success

b. Predictors: (Constant), Monitoring and evaluation of performance, Business plan and vision, Change management and culture program, Communication, Project champion, Project management, Top management support

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	1.397	.383		3.648
	Change management and culture program	-.046	.079	-.065	-.587
	Top management support	.291	.098	.402	2.964
	Business plan and vision	.191	.095	.270	2.002
	Project management	.045	.103	.056	.433
	Project champion	-.128	.090	-.185	-1.432
	Communication	.044	.087	.064	.507
	Monitoring and evaluation of performance	.167	.117	.209	1.427

Coefficients[a]

Model		Sig.	Correlations			Collinearity Statistics
			Zero-order	Partial	Part	Tolerance
1	(Constant)	.001				
	Change management and culture program	.559	.179	-.076	-.056	.742
	Top management support	.004	.615	.360	.282	.492
	Business plan and vision	.050	.493	.252	.191	.497
	Project management	.667	.436	.056	.041	.537
	Project champion	.158	.303	-.183	-.136	.540
	Communication	.614	.429	.066	.048	.573
	Monitoring and evaluation of performance	.159	.484	.183	.136	.423

Coefficients[a]

Model		Collinearity Statistics
		VIF
1	(Constant)	
	Change management and culture program	1.347
	Top management support	2.032
	Business plan and vision	2.012
	Project management	1.864
	Project champion	1.851
	Communication	1.745
	Monitoring and evaluation of performance	2.364